AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph beginning on line 20 of page 18 with the following rewritten paragraph:

However, as mixing channel **115B** lies between inlet ports **112A** and **112B**, mixing channel **115B** will contain both mobile phases. Thus, the inlets along distribution conduit **100** will provide mobile phases containing increasing concentrations of the selected mobile phase along the length of the distribution conduit from outlet **101A** to outlet **101D**. It should be evident that this mixing and redistribution process is repeated for each of the distribution conduits to result in the generation of a smooth gradient in the mobile-phase holding conduit **21**. Optionally, a plurality of waste/exhaust ports indicated at **121** is provided in fluid communication with mobile-phase holding conduit to allow any air or other fluid contained in the mobile-phase holding conduit to be displaced during the gradient generation process. As shown, the waste/exhaust ports may fluidly communicate with each other through converging conduits **123** at gradient outlet **125**. Once a gradient is generated in the mobile-phase holding conduit **21**, a pressurizing means (not shown) may be employed to provide a motive force to deliver the mobile phase contained in the mobile-phase holding conduit into the separation conduit **19** to carry out separation processes as described above and elsewhere herein.

Please replace the paragraph beginning on line 7 of page 23 with the following rewritten paragraph:

Thus, the invention also generally relates to a microfluidic device for producing a flow of mobile phase, wherein a producing means is provided to generate a gradient of a selected mobile-phase component in a mobile phase, to produce a mobile phase exhibiting different ~~concentration~~ concentrations of a selected mobile-phase component in different locations within the mobile phase, or both. Such a producing means typically comprises a mobile-phase-holding microconduit having a length defined by an upstream terminus and a downstream terminus, an outlet port located at the downstream terminus, and at least one inlet port in fluid communication with the mobile-phase holding microconduit upstream from the outlet port. A plurality of mobile-phase sources are also provided, wherein each source contains a mobile phase having a different concentration of a selected mobile-phase

component. An introduction means introduces plugs of mobile phase from the mobile-phase sources through the at least one inlet port into the mobile-phase holding conduit such that the plugs are arranged in a predetermined order along the length of the mobile-phase holding conduit. As illustrated in FIG. 2, the introduction means may be formed at least in part by a switching structure.

Please replace the paragraph beginning on line 7 of page 25 with the following rewritten paragraph:

Depending on the relative orientation of the switching plate and the substrate, at least two possible flow paths configurations can be created. As shown in FIG. 4B, the first flow path configuration allows a first mobile phase from a first mobile-phase source to travel, in order, through conduit **48A**, conduit **17A**, conduit **126C**, conduit **17B**, conduit **55**, conduit **17E**, conduit **128C**, conduit **17F** and conduit **53A**. The first flow path configuration also allows a second mobile phase from a second mobile-phase source (not shown) to travel, in order, through conduit **48B**, conduit **17C**, conduit **130C**, and conduit **17D**. Typically, the first and second mobile-phase sources contain differing concentrations of a mobile phase component. By rotating the switching plate **120** 60° about its center, a second flow path configuration results, as shown in FIG. 4C. The second flow path configuration allows the first mobile phase to travel, in order, through conduit **48A**, conduit **17A**, conduit **126C**, conduit **17F**, and conduit ~~**453A**~~ **53A**. In addition, the second flow path configuration allows the second mobile phase to travel, in order, through conduit **48B**, conduit **17C**, conduit **130C**, conduit **17B**, conduit **55**, conduit **17E**, conduit **128C** and conduit **17D**.

Please replace the paragraph beginning on line 29 of page 26 with the following rewritten paragraph:

Furthermore, two microconduits, indicated at **134** and **136**, are provided as plug-holding chambers. Microconduit **134** provides fluid communication between substrate conduits **17B** and **17D**, and microconduit **136** provides fluid communication between substrate conduits **17E** and **17H**. Such microconduits may comprise, for example, commercially available capillary tubing. Depending on the relative orientation of the switching plate and the substrate, at least two possible flow paths configurations can be

created. As shown in FIG. 5A, the first flow path configuration allows a first mobile phase from a first mobile-phase source (not shown) to travel, in order, through conduit **17A**, conduit **126C**, conduit **17B**, conduit **134**, conduit **17D**, conduit **128C** and conduit **17C**. The first flow path configuration also allows a second mobile phase from a second mobile-phase source (not shown) to travel, in order, through conduit **17G**, conduit **132C**, conduit **17H**, conduit **136**, conduit **17E**, conduit **130C**, and conduit **17F**. This configuration allows plug-holding chamber **134** to be filled by the first mobile phase and plug holding chamber **136** to be filled by the second mobile phase. By rotating the switching plate **120** 45° about its center, a second flow path configuration results, as shown in FIG. 5B. The second flow path configuration forms a first flow path extending, in order, through conduit **17A**, conduit **126C**, conduit **17H**, conduit **136**, and conduit **17E**, conduit **130C**, conduit **17D**, conduit **134**, conduit **17B**, conduit **128C** and conduit **17C**. The second flow path configuration also forms a second flow path extending, in order, through conduit **17G**, conduit **132C**, and conduit **17F**. Thus, by rotating the substrate of the switching assembly, a first mobile-phase plug defined by conduit **134** is introduced through conduit **17C** followed by a second mobile-phase plug defined by conduit **136**, which is followed by additional first mobile phase. By providing fluid communication between conduit **17C** and an inlet of a mobile-phase holding conduit (not shown), the mobile-phase holding conduit may be filled with a mobile phase that contains a first mobile-phase plug downstream from a second mobile-phase plug, which is downstream from an additional first mobile-phase plug, thereby forming an overall mobile phase, contained in the mobile-phase holding conduit, that exhibits differing concentrations of a mobile phase component.

Please replace the paragraph beginning on line 28 of page 27 with the following rewritten paragraph:

Thus, the invention provides, in yet another embodiment, a method for producing a flow of mobile phase. A mobile-phase source is provided comprising a mobile-phase-holding microconduit having a length defined by an upstream terminus and a downstream terminus, and an outlet port located at the downstream terminus, and a mobile phase, contained in the mobile-phase holding microconduit that exhibits differing concentrations of selected mobile-phase component along the length of the microconduit ~~a~~ substrate. The mobile-phase holding microconduit is pressurized to force the mobile phase within the mobile-phase holding

microconduit to flow toward the downstream terminus along the length of the microconduit and out of the outlet port. Optionally, at least one inlet port is provided fluid communication with the mobile-phase holding microconduit, wherein the outlet port is located downstream from the at least one inlet port of the mobile-phase holding microconduit. In such a case, a plurality of mobile-phase sources may be provided as well, each containing a mobile phase, wherein each mobile phase contains a different concentration of a selected mobile-phase component. Plugs of mobile phase from the mobile-phase sources are introduced through the at least one inlet port into the mobile-phase holding microconduit such that the plugs are arranged in a predetermined order along the length of the mobile-phase holding conduit.